

COURTENAY NEVILLE SMITHERS: HIS SCIENTIFIC CONTRIBUTIONS TO THE 'SMALL ORDERS' OF INSECTS

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Abstract

Courtenay Smithers' contributions to the knowledge of Psocoptera and other orders, notably Neuroptera and Mecoptera, are summarised. They extended over some 50 years and established him as a leading authority on these orders. His contributions to systematics, biogeography and biology of Psocoptera, particularly within the Australian region, were accompanied by compilations of global catalogues and bibliographies of immense value to others. His many publications assure him of a persistent place in the history of psocopteran studies.

Introduction

Courtenay Neville Smithers (1925-2011) was known and respected widely as an excellent naturalist with a keen, life-long sense of curiosity and wonderment that led to a variety of scientific interests, together with an enduring enthusiasm about communicating his passions to others. These personal traits rendered him a highly effective publicist for entomology and led to his writing of several books to introduce insects to the wider public. His 1971 'Australian Insects in Colour', with Anthony Healy, was a pioneer in all-colour popular publication, while his 'Handbook of Insect Collecting', first published in 1981, remains a useful and readable resource. His 'Backyard Beekeeping' has just been republished 25 years after it first appeared in 1987. However, his major formal scientific contributions focused on studying the systematics and biogeography of a commonly ignored insect order, the Psocoptera, augmented by original contributions on two other 'small orders', the Neuroptera and Mecoptera. His studies on these insects assure him of a lasting place in their documentation.

Psocoptera

Smithers' taxonomic interest in Psocoptera (the barklice and booklice) flowed from the 1950s (A. Smithers 2012), with his first papers on these insects (in 1956) the source of a stream that reached more than 150 contributions over more than half a century and established him firmly as a leading world authority for much of that period.

When I started to work on British psocids (in 1965), I wrote to Courtenay at the Australian Museum for his advice, and his kind and encouraging response – together with a set of his reprints then available – marked the start of a long friendship founded in our mutual interests in 'the other orders'. I met him first in England in 1967 and next at the XIIIth International Congress of Entomology in Moscow (August 1968), an occasion that marked perhaps the first major international gathering of psocid workers, with several meetings for the first time (Fig. 1); it was not until the 1980s that such a meeting of psocopterists, always few in number, was held again. Following my arrival in Australia in 1970, we continually exchanged ideas on psocids and lacewings.

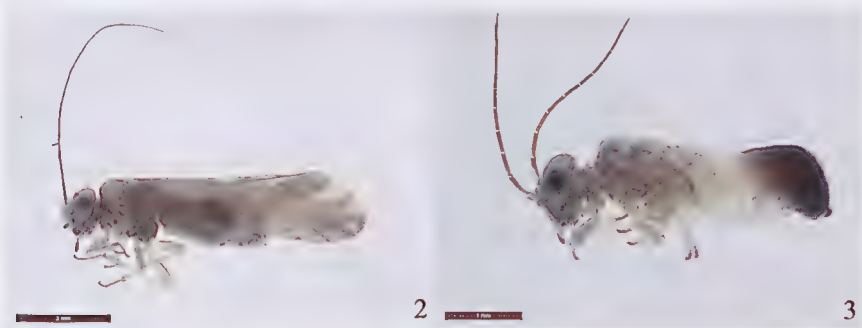


Fig. 1. Gathering of psocopterists outside Moscow University, August 1968. Left to right: A.M. Nadler (USA), T.R. New (UK), A. Badonnel (France), I.W.B. Thornton (Australia), C.N. Smithers (Australia) (Photo: V.N. Vishniakova).

While most of his published work deals with systematics, distributions and relationships of psocids, Courtenay was always aware that he was dealing with dynamic living organisms and, somewhat unusually for that era, his taxonomic studies flowed in large part from material collected during his own field studies, rather than from specimens mostly collected by others and submitted for identification. Biological oddities intrigued him greatly. One such was his discovery of the remarkable phragmotic nymphs of *Psilopsocus mimulus* Smithers (Figs 2-3), which resemble small bark beetles and live in twigs, blocking the entrance to their tunnels with their heavily sclerotised abdomens (Smithers 1995). His knowledge spanned the world fauna.

Among his first major self-appointed tasks was to bring together the then very widely scattered literature on Psocoptera into a single, easily available and convenient format: his 'Bibliography of the Psocoptera' (Smithers 1965, with drafts circulated to most specialists for comment and augmentation) was of incalculable value to tyros such as myself. His comment in the introduction that it was 'an attempt to provide a working tool which will relieve students ... of the drudgery of compiling their own bibliographies' was indeed pertinent. The Bibliography was followed by a World Catalogue of species (Smithers 1967). The two works together provided, for the first time, a firm basis for later studies; subsequent progress in understanding

Psocoptera over the last half century is largely due to Smithers' Herculean efforts in producing these accounts. It is worth remembering that these compilations were made long before availability of computers, email and even routine use of photocopiers – so that obtaining and checking the numerous obscure references for verification could entail weeks of patience awaiting international postage, or laboriously copying out details by hand during sporadic visits to major institutional libraries. They were followed (Smithers 1972) by publication of his Ph.D. thesis, a global synthesis of psocid classification and phylogeny, with illustrated diagnoses of all genera and families then known and discussions of putative relationships that set a basis for much later consideration. It remains a potent reference source of earlier information and diagnoses.



Figs 2-3. The wood-boring psocid, *Psilopsocus mimulus* Smithers: (2) adult male from Lindfield, NSW (AM Paratype K68224); (3) final instar nymph with abdomen modified to plug burrow, from same series (Photos: D. Britton, Australian Museum)

These landmark publications were revised later, with new keys to families and genera (Smithers 1990), a revised Bibliography (with Charles Lienhard: Smithers and Lienhard 1992) and Smithers' magisterial joint volume (Lienhard and Smithers 2002), as a world catalogue and bibliography, updating these to comprise perhaps the single most significant publication ever issued on the order. The classification used there was essentially that of Smithers (1990) and pre-dated current opinion that the order is not monophyletic but intertwined intricately (as 'Psocodea') with the true lice, Phthiraptera (Yoshizawa and Johnson 2006).

Psocoptera had become much better known between 1967 and 2002, in no small part reflecting the impact of the publications noted above in collectively facilitating the perspective needed for others to study these insects. The known richness of Psocoptera rose from 1605 species (in 197 genera) in 1964 to 4408 species (371 genera) by 2000, together with an increase from 31 to 41 generally recognised families. Smithers was an active contributor to this increase. Alone or with his collaborators (notably the late Ian Thornton and in associations that led to global dominance of Psocoptera

studies by Australians for some two decades), he described somewhat more than 350 new species of psocids, across about 25 families. Many of these came to his attention though extensive field work and collecting in Australia and – with Thornton – during a major Australian Research Grants-funded survey during the 1970s of the various islands, including New Guinea and the Melanesian Arcs, to the north and east of Australia.

While his first major regional synopsis dealt with the psocids of Madagascar (Smithers 1964), his first paper from the Australasian region (following his move from South Africa to the Australian Museum in 1960) dealt with Philotarsidae from Macquarie Island (Smithers 1962). However, the account that founded his reputation in the Australasian fauna was a major paper on the New Zealand fauna (Smithers 1969), with 15 new species bringing the country's total to 43 species. His early African experiences assuredly whetted his appetite for biogeographical puzzles centred in the 'southern continents' and the regional fauna remained his primary focus for many years. From the early 1960s he published notable species additions and family synopses of the Australian psocids and, by the time he prepared the entry on Psocoptera for the Zoological Catalogue of Australia (Smithers 1996), he had described well over a third of the Australian species then known. These included records of several families new to the country, as well as a number of novel genera that hinted at the considerable complexity and high levels of endemism of the fauna. His successive chapters in the original (1970) and revised (1991) editions of 'The Insects of Australia' revealed an increase from 120 to 299 species over that period. Regional accounts, such as for South Australia (Smithers 1984) and (jointly) for Norfolk Island (Smithers and Thornton 1974) and Lord Howe Island (Smithers and Thornton 1975), were augmented by substantial family accounts for the Melanesian Arc psocids that collectively set a new perspective for their diversity and evolution within the region.

Families such as Philotarsidae, Calopsocidae, Myopsocidae and Psocidae proved to be far more diverse, intricate and biogeographically informative than suspected before these studies began. Elucidating their features did much to enhance understanding of the Australian fauna and how this had developed. Many of the places visited in Melanesia had never been explored properly for psocids, although the few taxa described sporadically from New Guinea and elsewhere suggested the likely richness of those areas. The fieldwork in remote areas was sometimes hazardous, frequently adventurous and innovative. Courtenay recalled some of these adventures in our tribute to Ian Thornton (New and Smithers 2004). However, his dedication and care resulted in the Australian Museum now housing one of the all-time greatest and most representative collections of this order.

Smithers's seminal work on psocids has been commemorated by his colleagues by seven species named '*smithersi*'. One of these he himself

synonymised, a step that accorded him some amusement. Members of the genus *Sigmatoneura* Enderlein (Psocidae) are characterised by extensive sexual dimorphism, so that males and females can be associated clearly only by co-occurrence. Before this sexual difference was appreciated, I had described a male and female from Nigeria (collected at the same general locality but a year apart) as separate taxa (New 1973). Courtenay later decided that the more parsimonious approach was to consider them conspecific; unfortunately, the second described was '*smithersi*'. In the same paper, though, he also sunk *Scaphopsocus* Smithers as a new synonym of *Sigmatoneura*! Two other psocid species are named '*smithersorum*', acknowledging Smila's continued encouragement and support throughout their long partnership. Courtenay himself named a number of psocids '*alettae*' in appreciation of Smila's notable contributions. Two patronymic genera also exist: *Smithersia* Thornton (Myopsocidae) and *Smithersiella* Badonnel (Caeciliusidae).

Neuroptera

The psocopteran patronyms are augmented by five patronymic lacewings, marking another of his favourite insect orders. Courtenay's interest in Neuroptera was also a long one and, although he did not publish as extensively on them, his knowledge was broad and exceptional. He described a number of new Australian species, across four families, and wrote a number of biological notes. Sadly, his long-projected revision of Australia's spongeflies, Sisyridae – a project we talked about at our first meeting, when I was able to show him one of the three British species in the field – was not completed, although he described several new species in isolation, including *Sisyra pedderensis* Smithers, an endemic to Tasmania's Lake Pedder (Smithers *et al.* 2008) and the last insect he described (Figs 4-6).

Other Orders

His interests in 'the other orders' also included Zoraptera (the chapter in 'Insects of Australia') and Mecoptera, for which he described a remarkable endemic genus, *Tythobittacus*, from the Blue Mountains (Smithers 1973) and produced a synopsis of Australian taxa (Smithers 1987). A full bibliography of his publications is given by Britton (2012).

In an era in which specialisation is the norm, Courtenay Smithers' entomological interests remained broad, but never forgoing depth and authority. His commitment to advancing knowledge of Australian insects was coupled with an equally strong commitment to their conservation. His legacy is enduring and few could claim to have changed perspective of any insect order to the extent that his studies on psocids, in particular, have done. His responses to queries were always generous and informative and the encouragement he gave to me, and to other less experienced colleagues, will be remembered with gratitude and affection.



Figs 4-6. Adult, host and habitat of the spongefly, *Sisyra pedderensis* Smithers from Lake Pedder, Tasmania: (4) adult female (Photo: G.N. Forteath); (5) encrusting freshwater sponge, *Radiospongilla pedderensis* Osborn, Forteath and Stanisic, larval food of *Sisyra pedderensis* (Photo: A.W. Osborn); (6) Lake Pedder, Tasmania, type locality of both species (Photo: A.W. Osborn).

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